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Archaeological Survey of the Knight Arnold
Road Bridge and Approach at Nonconnah Creek,
Memphis, Tennessee

Prepared for the
City of Memphis
Division of Engineering

by

Gerald P. Smith

April 1991

Archaeological Survey of the Knight Arnold
Road Bridge and Approach at Nonconnah Creek,
Memphis, Tennessee

INTRODUCTION

This project was carried out as a survey of the Knight Arnold Road bridge and approach right-of-way at Nonconnah Creek. The route extends approximately 2500 feet from Kirby Parkway to Quince Road across the Nonconnah Creek floodplain and Nonconnah Creek itself. Right-of-way width ranges from about 100 feet over most of its length to about 150 feet at the bridge site where up to 15 feet of fill work is required. The survey area is in an open old field, partly filled from Sta. 0+00 to 10+00, and unfilled from Sta. 10+00 to Nonconnah Creek. No cultural remains were found during the survey.

ENVIRONMENTAL SETTING AND
RESOURCE POTENTIAL

Nonconnah Creek was a meandering stream with a relatively broad floodplain until channelization during this century. Recent vegetation consisted of gum-cypress swamp forest in the floodplain and oak-hickory in the upland

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portion of the drainage. All the tributaries are seasonal, with narrow floodplains in steeply dissected terrain.

At the height of the last half of the Wisconsin glaciation, about 21,000 to 15,000 B.C., the Ohio River occupied the present Mississippi River valley east of Crowley's Ridge and was down-cutting previous valley fill in response to the lowered sea levels of the time. Recent studies in the mid-continent region suggest that temperatures during this period averaged about 12°C (22°F) below present (Brister et al. 1980:30), but remained above -40°C (-40°F) (Delcourt et al. 1980:13). Vegetation consisted of spruce-northern pine forest on the uplands, with beech, red maple, black walnut, sweet gum, and other hardwoods surviving in sheltered areas.

By about 15,000 B.C. a gradual warming trend began the final retreat of the Wisconsin ice sheet and the refilling of the Mississippi River valley with glacial outwash. It was also at this time that the Mississippi River cut through Crowley's Ridge at the Bell City-oran (Missouri) Gap and joined with the Ohio River in forming a complex braided-stream pattern between Crowley's Ridge and the eastern bluff line. Filling of the valley ultimately reached a higher elevation than the present surface of most of the valley floor north of Memphis; this earlier surface survives in remnant form in such features as Malden Plain in southeastern Missouri and remnant braided stream terraces in western Dyer and Lauderdale Counties in Tennessee. Renewed loess deposition in the uplands accompanied development of the extensive braided-stream formation with

its large areas of bare soil. Valley filling continued until about 9000 B.C. when glacial retreat reopened the St. Lawrence River valley as the primary outlet for glacial meltwaters.

Climatic warming was also accompanied by resurgence of such deciduous forest species as oak, ash, hickory, beech, maple, walnut, and birch. Replacement of the northern coniferous forest may have been virtually complete by as early as 10,500 B.C. This forest transition would have greatly increased the carrying capacity of the area for all modern game species, but removed the boreal forest habitat apparently favored by the mastodon. Continued warming to conditions somewhat cooler than present during the period between 10,000 to 5,000 B.C. led to a mesic deciduous forest, including a few conifers, beech, birch, elm, ash, maple, oak, hickory, walnut, and chestnut. Warming and drying of the climate peaked between 5,000 and 3,000 B.C. with conditions somewhat warmer and dryer than at present. During this period the species requiring cool, moist conditions were sharply reduced and the modern oak-hickory dominance was established in the upland portion of the drainage. Major habitat zones included floodplain, terrace, and upland areas.

Four relevant apparent terrace surfaces are definable in the Loosahatchie drainage, at 3 to 5 ft above the modern floodplain, with others at 10 to 23 ft, 22 to 40 ft, and 55 to 60 ft. This is a pattern shared by other terraces adjacent to west Tennessee streams tributary to the Mississippi River,

and is thought to date from a time during, or beginning just before, the Wisconsin glaciation (Smith 1980; Saucier, n.d.). They would correspond to subdivisions of Saucier's Finley Terrace and Smith's T-2a or T-1 (lower) terraces, and to Saucier's Hatchie Terrace and Smith's T-2b (upper) Terrace in adjacent drainages. The controlling factor in their formation is viewed as the level of glacial outwash and its subsequent downcutting. Saucier attributes the Finley Terrace to Early Wisconsin events prior to 30,000 B.C. and the Hatchie Terrace to the Sangamon Interglacial, between 120,000 and 80,000 B.C. Due primarily to a lack of dissection of the loess and loess/silt terraces, it may be reasonable to consider the Finley/T-2b or T-1 terrace as dating to between 15,000 and 10,000 B.C., during the period of glacial outwash build-up in the Mississippi Valley, and the Hatchie/T-2 surface as corresponding to the outwash build-up which occurred at the end of the Early Wisconsin glaciation prior to 30,000 B.C.

The ecological effects of the terraces are unknown for the premodern forest types, but they are of significance in the modern context. Review of terraces in adjacent drainages (Smith 1979a, 1979b, 1980) indicates that Grenada, Calloway, and Henry silts characterize the terraces, while Waverly and Falaya soils make up the current floodplain. The uplands are composed mainly of Memphis, Loring, and Grenada soils. Of crucial importance in this context is the tendency of shagbark and scalybark hickories to form groves on Grenada and Calloway

soils on terraces, while the upland species are predominantly those too high in tannic acid for human use without special processing. Other important terrace forest species would have been pin oak, red oak, cottonwood, sycamore, sweet gum, and persimmon. The variety of understory species includes vines, shrubs, herbaceous plants, and cane. Floodplain forests include tupelo, red gum, cypress, willow, and a variety of other tree species. As in the uplands, cane is important understory species, along with a wide variety of shrubs, vines, and seasonal herbs.

Upland forests consisted of red and white oaks with upland hickories as the primary species. Major secondary species included elm, chestnut, yellow (tulip) poplar, sweetgum, and walnut in the canopy, and dogwood, cherry, mulberry, persimmon, sassafras, and winged elm in the understory. Again, a wide range of shrubs, vines, and herbs is present. Plant resources are thus generally diffuse in distribution, except for the seasonal occurrence of shagbark and scalybark hickory nuts in groves on terraces.

The primary game animals of the area are white-tailed deer, turkey, rabbit, black bear, opossum, and raccoon. Ducks, geese, and passenger pigeons would have been important seasonal game species. Fish and turtles would have been available in permanent streams of the drainage such as Black Bayou and Nonconnah, Cane, and John Creeks, as well as seasonal streams and ponds. Animal food resources may thus be characterized

as diffuse in nature except for possible seasonal concentrations of migratory birds.

Siliceous lithic resources occur near the drainage as chert and quartzite gravels outcropping from below the Pleistocene loess in the bed of Loosahatchie River, and at the base of the Mississippi River bluffs. Ferruginous sandstone and siltstone are readily available in a broad band stretching through west-central Tennessee and central Mississippi, occurring within 30 miles east of the drainage basin. The ferruginous siltstone was widely used in the region for atlatl weights, gorgets, celts, and a variety of generalized rough bifacial tools.

Resource distribution in the drainage thus includes those of diffuse distribution, such as most of the plants and game mammals, and those of linear distribution such as lithic and aquatic resources. The key concentrated resources include fall shagbark and scalybark hickory nuts in the groves on Grenada and Calloway soils on terraces, and fall and spring migratory waterfowl in areas of seasonally standing water. Hickory nuts thus appear to be the most strategic resource, in localized concentrations between aquatic and upland resources at the beginning of the season when storable food supplies would be most crucial to the survival of nonagricultural human populations.

The very conditions which appear to favor the formation of shagbark and scalybark hickory groves, namely a shallow fragipan producing waterlogged soil through late spring or

even early summer (Flowers 1964:6, 11), also sharply reduce the utility of these soils for agriculture. Such soils are difficult to work until late in the planting season, are subject to wet-year moisture damage to crops, and provide an effective barrier to root growth during dry years.

Prehistoric agricultural activities tend to focus on better-drained soils such as Collins, Memphis, Loring, or upland Grenada soils. Collins soils are usually too low in this drainage for effective use, but represent the general class of sandy soils particularly favored by agriculturalists using hand tools. Loess soils such as Memphis and Loring tend to be used effectively only by those equipped with iron or steel implements, usually operated with draft animals or machines to augment human physical strength.

Environmental factors would thus appear to favor several different subsistence-settlement considerations. The diffuse distribution of the primary game animals suggests that hunting activity would occur throughout the drainage with little point concentration other than a search for seasonal waterfowl. Sharp restriction of the distribution of shagbark and scalybark hickory resources suggest that areas of Grenada and Calloway soils on terraces would have been particularly important for fall gathering activities. Sandy soils are generally considered of particular importance to agriculturalists using only hand tools, provided that drainage conditions are suitable. The upland loessic soils would have been of particular agricultural

interest to nineteenth-century Euro-American settlers with their iron plows, but not to prior occupants without such equipment.

Cultural Background

General Summary

The cultures represented in the drainage fall within the basic cultural sequence of western Tennessee as outlined in studies of most of the major Mississippi River drainages (Smith 1972, 1979c, 1980; Smith and Weinstein 1987; Peterson 1979a, 1979b). The primary prehistoric cultural periods include Paleoindian, Archaic, Woodland, and Mississippian, each with various subdivision based on time span and content.

Paleoindian components are characterized by a variety of large, fluted projectile point types; scrapers, perforators, and gravers often made on ribbon-like blades of flint or chert; and prepared cores from which blades were struck. Flakes and nonblade cores are also present, but not distinct from those of later periods. Subsistence is conventionally considered to have been based on primarily upon hunting large game animals. Social and settlement systems are thought to have consisted of small bands of kinsmen following the movement of game animals, often Pleistocene megafauna. The estimated time span of this period is about 10,000 to 8500 B.C.

The Archaic period is a long post-Pleistocene period characterized by progressively increasing emphasis on plant

foods as the primary subsistence base, along with increasing social complexity. Introduction of woodworking tools and grindstones, along with use of a variety of notched projectile points characterizes the Early Archaic. The points appear designed for use with spear throwers on swift-moving game such as deer rather than as thrusting spears usable on slow-moving game unlikely to flee. The blade tools characteristic of the Paleoindian period seem to have gone out of use by the end of the Early Archaic. Lower-grade and/or smaller-sized raw materials locally available replaces the relatively uncommon grades and sizes of raw material necessary for the blade-based tools and weapons. The Early Archaic is generally thought to range from 8500 to 5500 B.C.

Middle Archaic components in neighboring areas are characterized by stemmed projectile points, often large and formed by minimal flaking, and ground stone tools and ornaments. The period is particularly poorly known in the region. A time span of about 5500-3500 B.C. or even as late as 2000 B.C. is often cited for the period.

The Late Archaic is characterized by a variety of large-stemmed point types, ground stone tools and ornaments. Many sites of the period are much larger than those of previous periods. It was during this period that a series of incipient changes occurred in the subsistence and social systems; changes that would continue through the rest of the prehistoric sequence.

Among these were the beginnings of plant domestication, long-range trade in exotic raw materials and finished items, and increasingly complex social organization with definable status positions. Subsistence patterns emphasize exploitation of seasonally concentrated resources. Regional stylistic traditions of distinctive point types occur throughout the eastern United States, involving much smaller areas than in previous periods. The Loosahatchie drainage includes the frontier between one tradition centered in the northern Mississippi Alluvial Valley and another centered in the western portion of the Tennessee River Valley.

The time span of the Late Archaic period varies considerably from one area to another, basically from the local end of the Middle Archaic to the beginning of the following period. The beginning of the period in the Midsouth is variably placed at either about 3500 B.C. or 2000 B.C., depending on the assignment of the Benton complex; the 3500 B.C. date will be used here. The end date of the period also varies according to the treatment and definition of the following period, usually Woodland. The nonpottery-using Poverty Point cultural tradition of the Mississippi Valley has variously been considered part of the Late Archaic, a separate cultural period in its own right (Phillips 1970), or ambiguously labelled "Transitional" (Peterson 1979a, 1979b). The Poverty Point-related cultures will be considered part of a separate Poverty Point period,

thus placing the end of the Late Archaic at about 1500 to 1000 B.C. in the Midsouth.

The terminal Archaic period includes a Poverty Point-derived cultural phenomenon restricted to the Mississippi River alluvial valley and adjacent areas. It is marked by a distinctive series of projectile point, tool, and ornament types and by fired clay objects of various styles apparently used in earth-oven cooking. Particularly distinctive items, other than the point types, are a microblade industry and insect-effigy stone beads. The focal site of the period in northern Louisiana was involved in extensive trade with contemporary cultures generally considered Late Archaic and/or Early Woodland, and is known to have utilized items from as far away as Indiana. The time span of the period approximates 1500-400 B.C., with some local variation.

The Early Woodland period in the area is marked by the appearance of local ceramics, although complexes to the east, which are usually considered Late Archaic, had already been using pottery for several centuries. Point styles are derived from previous late Poverty Point styles. Burial mounds are thought to have come into use during this period. The local ceramic styles are typical of those of the lower Mississippi River valley, although the use of sandy ceramic paste and cordmarked surface finishes appear by the end of the period. A time span of about 400 B.C. to A.D. 100 would be the likely maximum for the period locally, with a span as short as 200 B.C. to A.D. 1 possible.

Middle Woodland culture in the Midsouth is most closely related to the Miller tradition derived from the upper Tombigbee River drainage. It is characterized by sand-tempered ceramics with plain and cordmarked surface finishes. Point styles appear to continue the stemmed forms of the previous period. Burial mounds continue in use, while flat-topped mounds also appear at some major centers. An estimated time span for the period is about A.D. 100-400.

Late Woodland occupation in the area is closely tied to the Mississippi River alluvial valley and immediately adjacent areas. Characteristic artifacts include clay-tempered plain, cordmarked, and check-stamped pottery; and small, thin stemmed-to-corner-notched points probably used on arrows. Burial mounds continue in use. The approximate time span of the period is A.D. 400-900.

Mississippian culture in the area is also closely tied to the Mississippi River alluvial valley. It is characterized by plain, incised, engraved, and painted ceramics in a variety of forms; triangular and willow-leaf-shaped arrow points; a hierarchy of site form ranging from camps, hamlets, and villages, through villages with one or two mounds facing a central plaza, to major centers with multiple large platform mounds facing one or more plazas. Large-scale corn agriculture, supplemented by other crops, hunting, and fishing provided the subsistence base. Social systems may well have involved tribes at the

beginning of the period, but are generally considered to have become complex chiefdoms by the period's end. Early Mississippian ceramics are relatively simple and clay-tempered, but the change to shell-tempered wares had taken place by about A.D. 1200. The total local span of the period approximates A.D. 900-1500. The period was probably effectively ended locally by a virtual total depopulation brought about through epidemics of European and African diseases immediately after the passage of the DeSoto expedition through the area in 1541.

The colonial/pre-Jacksonian Purchase period is very poorly known for the area. There appears to have been little or no permanent occupation until the establishment of a Spanish fort at the mouth of the Wolf River in 1793 (S. Smith 1982) and its associated trading post activity. The Marquette and Joliet, LaSalle, and other expeditions passed by or through the area without leaving a known trace, as did the Bienville expedition of 1736 which the French launched against the Chickasaw. Little is known of the pre-1818 settlement of scattered squatters over the area. After the Jackson Purchase of western Tennessee and Kentucky from the Chickasaws in 1818 legitimized Anglo-American settlement, the area filled rapidly.

Most of the primary towns and roads in Shelby County were established by 1840, although smaller towns often did not hasten into the formalities of a charter or government until later.

Previous Research in the Study Area

Previous research in the project vicinity consists of surveys along Nonconnah Creek (Gilbert Commonwealth 1981; Smith 1972; Smith and Weinstein 1987) and early surveys conducted by various Memphis State University personnel. Sites 40SY48 and 40SY49 were adjacent to the right-of-way, but destroyed in recent years by construction of an apartment complex. Site 40SY49 was used intermittently from the Poverty Point through the Mississippian periods, with one of the largest Middle Woodland settlements in the drainage as its main occupation.

Field Conditions and Methods

The entire right-of-way was open land with grass and weed cover. Right-of-way staking at 100-foot intervals along the project centerline was in place and served as a transect guide. A 30-cm square shovel test 50 cm deep was excavated adjacent to each stake during the April 7 survey. Gully activity draining into a small tributary stream near Station 10+00 revealed about 10 feet (3 m) of modern fill in that area.

Survey Results and Recommendations

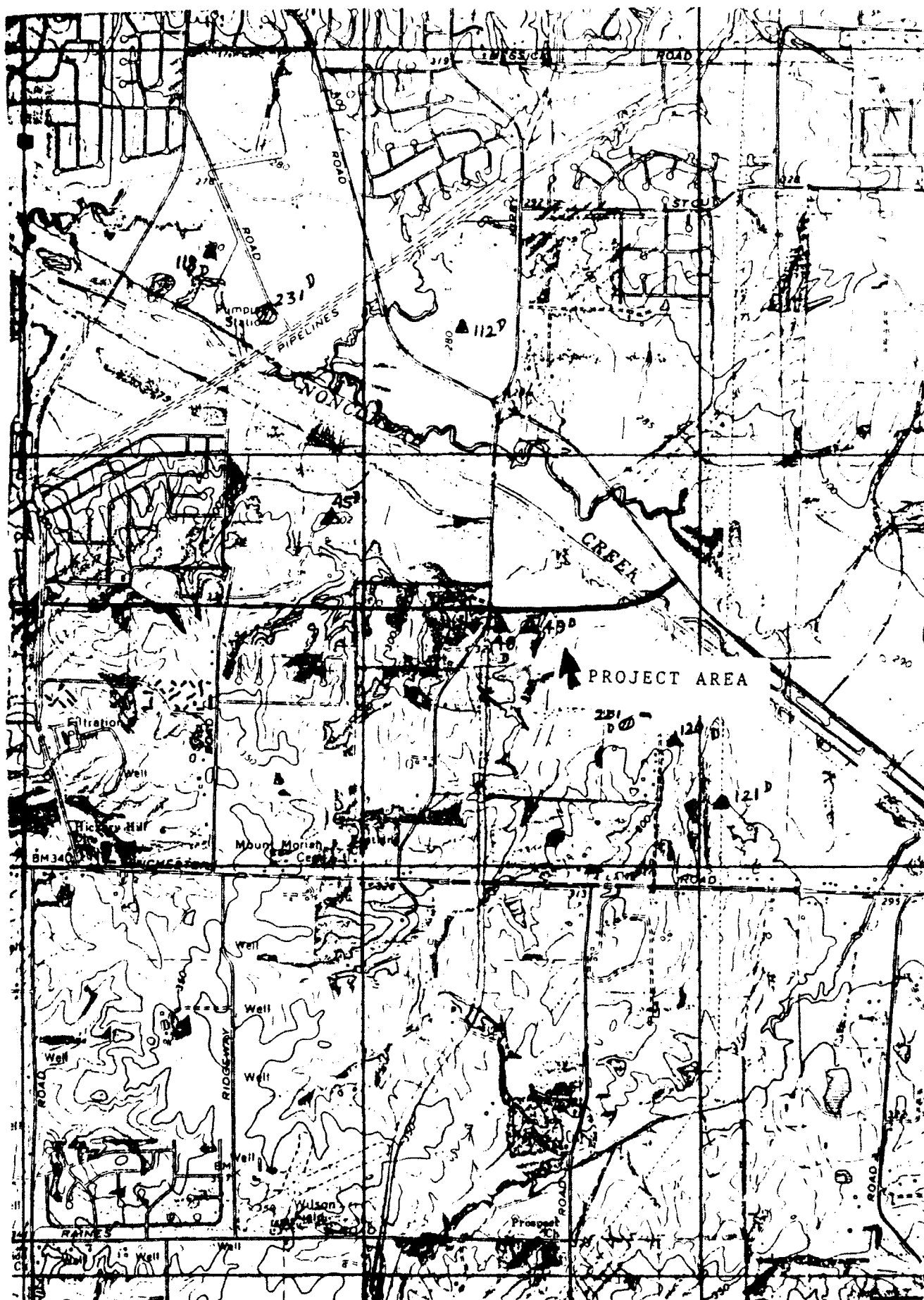
Testing of the western 1000 feet of the right-of-way revealed that it had once been graded and provided with a

gravel layer at least 30 cm (1 foot) deep, which was subsequently covered with a thin mantle of fill. The rest of the route was characterized by gleyed silts and clays with occasional sand, gravel, and loess lenses. No cultural remains were recovered during the survey and there was no indication of midden deposits in any of the tests. It is therefore recommended that the project area be cleared with regard to cultural resources without further investigations.

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Project area location, Germantown 7½' 1965, photorevised 1973